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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/937,949 | SEBIRE ET AL. | |
| | Examiner | Art Unit | |
| | Salman Ahmed | 2616 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *07 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *43-83* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *43-83* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/2/2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

Claims 43-83 are pending.

Claims 43-83 are rejected.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 43 and 45-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dent *(US* Patent No. 6,084,865) in view of Tran et al. (US PAT 5517504), hereinafter referred to as Tran.

In regards to claim 43 Dent teaches a telecommunications system comprising a first station adapted to communicate with a second station over a wireless channel (see col. 1, lines 9-16), data being carried over the wireless channel in superframes (see Fig. 2), each superframe comprising a plurality of frames (see col. 5, lines 9-49) and each frame comprising a plurality of timeslots (see col. 12, lines 14-25); the system having: a first mode of operation in which a full rate data channel for circuit switched communications (see Fig. 11, col. 19, lines 58-66, PSTN means circuit switched communications) is defined by an allocation to that data channel (see col. 2, lines 8-27) of corresponding time slots in each frame (see col. 18, lines 44-60); a second mode of operation in which two half rate data channels for circuit switched, communications are defined by an allocation to each of said two data channels (see col. 2, lines 8-27) of an equal number of corresponding time slots of frames in each superframe (see col. 1, lines 53-61, col. 18, lines 44-60); a third mode of operation in which four quarter rate data channels for circuit switched communications are defined by the allocation to each of those data channels (see col. 2, lines 8-27) of an equal number of corresponding time slots of frames in each superframe (see col. 6, lines 38-65, "when factor is 4, frame-length/slot is 32 means quarter rate 1/4" and col. 15, line 53-to-col. 16, line 7).

Dent does not explicitly teach a first mode of operation and a second mode of operation (cited in the claim as fourth mode and fifth mode respectively) is being done in a packet switched communication as well.

Tran in the same field of endeavor teaches (column 1 lines 35-45) subscriber units may attempt to increase efficiency for a wireless system that is primarily intended for circuit-switched traffic by using excess system capacity for packet-switched data services via similar subscriber unit equipment.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dent's circuit-switched TDMA system/method by incorporating the concept of using packet switched data as taught by Tran. The motivation is that (as suggested by Tran, column 1 lines 35-45) Packet data as oppose to circuit switching data provides more network robustness due to path independence and the routers' ability to select alternative paths in the event of network node failure. Packet switching, therefore, allows for more efficient use of the network lines. Packet technology offers the option of billing the end user based on amount of data transmitted instead of connection time. If the end user's application has been designed to make efficient use of the air link, then the number of packets transmitted will be minimal. If each individual user's traffic is held to a minimum, then the service provider has effectively increased network capacity.

Regarding to claim 77. Dent teaches a communications system comprising a first station adapted to communicate with a second station over a wireless channel (see col. 1, lines 9-16), data being carried over the wireless channel in superframes, each superframe comprising a plurality of frames (see col. 5, lines 9-49) and each frame comprising a plurality of timeslots (see col. 12, lines 14-25); the system having: a first mode of operation in which a full rate data channel for switched communications is

defined by the allocation to that data channel (see col. 2, lines 8-27) of corresponding time slots in each frame (see col. 18, lines 44-60); a second mode of operation in which two half rate data channels for switched communications are defined by the allocation to each of those data channels (see col. 2, lines 8-27) of an equal number of corresponding time slots of frames in each superframe (see col. 1, lines 53-61, col. 18, lines 44-60).

Dent does not explicitly teach a first mode of operation and a second mode of operation is being done in a packet switched communication.

Tran in the same field of endeavor teaches (column 1 lines 35-45) subscriber units may attempt to increase efficiency for a wireless TDMA system that is primarily intended for circuit-switched traffic by using excess system capacity for packet-switched data services via similar subscriber unit equipment.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dent's circuit-switched TDMA system/method by incorporating the concept of using packet switched data as taught by Tran. The motivation is that (as suggested by Tran, column 1 lines 35-45) Packet data provides more network robustness due to path independence and the routers' ability to select alternative paths in the event of network node failure. Packet switching, therefore, allows for more efficient use of the network lines. Packet technology offers the option of billing the end user based on amount of data transmitted instead of connection time. If the end user's application has been designed to make efficient use of the air link, then the number of packets transmitted will be minimal. If each individual user's

traffic is held to a minimum, then the service provider has effectively increased network capacity.

Regarding to claim 62 Dent teaches a communication system comprising a first station adapted to communicate with a second station over a wireless channel (see col. 1, lines 9-16), data being carried over the wireless channel in superframes (see Fig. 2), each superframe comprising a plurality of frames (see col. 5, lines 9-49) and each frame comprising a plurality of timeslots (see col. 12, lines 14-25); the system having a mode of operation in which a data channel for circuit switched communications (see Fig. 11, col. 19, lines 58-66, PSTN means circuit switched communications) is defined by the allocation to that channel of corresponding time slots (see col. 2, lines 8-27) of some of the frames of each superframe,

Dent does not explicitly teach using channel time slots as data channel for packet switched communications.

Tran in the same field of endeavor teaches (column 1 lines 35-45) subscriber units may attempt to increase efficiency for a wireless TDMA system that is primarily intended for circuit-switched traffic by using excess system capacity for packet-switched data services via similar subscriber unit equipment.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dent's circuit-switched TDMA system/method by incorporating the concept of using packet switched data as taught by Tran. The motivation is that (as suggested by Tran, column 1 lines 35-45) Packet data provides more network robustness due to path independence and the routers' ability to select

alternative paths in the event of network node failure. Packet switching, therefore, allows for more efficient use of the network lines. Packet technology offers the option of billing the end user based on amount of data transmitted instead of connection time. If the end user's application has been designed to make efficient use of the air link, then the number of packets transmitted will be minimal. If each individual user's traffic is held to a minimum, then the service provider has effectively increased network capacity.

Regarding to claim 44. Dent teaches a communication system as claimed in claim 43, wherein equal numbers of timeslots in each frame are allocated to the data channel (see col. 2,lines 8-27) for circuit switched communications and the data channel for packet switched communications (see col. 1, lines 53-61).

Regarding to claim 45. Dent teaches a communication system as claimed in claim 43, wherein half the number of slots are allocated to the data channel for packet: switched communications are allocated to the data channel for circuit switched communications (see col. 1, lines 53-61, col. 18, lines 44-60).

Regarding to claim 46. Dent teaches a communication system as claimed in claim 43, wherein a quarter of the number of slots are allocated to the data channel (see col. 2, lines 8-27) for packet switched communications are allocated to the data channel for circuit switched communications (see col. 6, lines 38-65, "when factor is 4, frame-length/slot is 32 means quarter rate 4" and col. 15, line 53-to-col. 16, line 7).

Regarding to claim 47. Dent teaches a communication system as claimed in claim 43, wherein the data channel for circuit switched communications is a half rate data channel (see col. 1, lines 53-61, col. 18, lines 44-60).

Regarding to claim 48. Dent teaches a communication system as claimed in claim 43, wherein the data channel for circuit switched communications is a quarter rate data channel (see col. 6, lines 38-65, "when factor is 4, frame-length/slot is 32 means quarter rate '/. " and col. 15, line 53-to-col. 16, line 7).

Regarding to claim 49. Dent teaches a communication system as claimed in claim 43, wherein the data charnel for packet switched communications (see Fig. 9, item "161 "means for packet switched communication) is a half rate data channel (see col. 1, lines 53-61, col. 18, lines 44-60).

Regarding to claim 50. Dent teaches a communication system as claimed in claim 43, wherein control data for control of the data channel for packet switched communications is carried by the data channel for circuit switched communications (see col.9, lines 1-16, and col. 19, lines 58-66).

Regarding to claim 51. Dent teaches a communication system as claimed in claim 51, wherein the control data is for control of transmission power and/or handover of the channel, link adaptation (see col. 17, lines 3-16).

Regarding to claim 52. Dent teaches a communication system as claimed in claim 51, wherein the control data comprises a fast associated control channel and/or a slow associated control channel (see col. 5, lines 10-49).

Regarding to claim 53. Dent teaches a communication system as claimed in claim 43, wherein the data channel for circuit switched communications is a conversational channel (see col. 5, lines 10-49, col. 14, lines 18-29, and col. 18, line 18-34).

Regarding to claim 54. Dent teaches a communication system as claimed in claim 43, wherein the data channel for circuit switched communications is a background channel (see col. 8, line 40-to-col. 9, line 16, and col. 12, lines 26-54).

Regarding to claim 55. Dent teaches a communication system as claimed in claim 43, wherein the data channel for packet switched communications is allocated time slots during periods (see col. 2, lines 8-27) when the data channel for circuit switched communications is relatively inactive (see col. 22, line 65-to-col. 23, line 24).

Regarding to claim 56. Dent teaches a communication system as claimed in claim 56, wherein the data channel for packet switched communications is allocated time slots (see col. 2, lines 8-27) during lulls in speech data being carried by means of the data channel for circuit switched communications (see col. 22, line 65-to-col. 23, line 24).

Regarding to claim 57. Dent teaches a communication system as claimed in claim 43, wherein the wireless channel (see col. 2, lines 8-27) comprises a circuit switched air-interface data being carried over said circuit switched air-interface (see Fig. 11, col. 2, lines 8-27) via circuit switched data and packet data (see Fig. 9, item "161 "means for packet data).

Regarding to claim 58. Dent teaches a communication system as claimed in claim 58, wherein said circuit switched air interface (see Fig. 11, col. 2, lines 8-27) is connectable to a packet switched core network (see Fig 9, item "161 "means for packet switched communication).

Regarding to claim 59. Dent teaches a communication system as claimed in claim 43, wherein the circuit switched channel is via a circuit switched core network of the communication system (see Fig. 11, col. 19, lines 58-66, PSTN means circuit switched communications).

Regarding to claim 60. Dent teaches a communication system as claimed in claim 43, wherein the packet switched channel is capable of operation via a packet switched core network of the communication system (see Fig. 9, item "161 "means for packet switched communication, col. 19, lines 58-66, and col. 21, lines 19-44).

Regarding to claim 61. Dent teaches a communication system as claimed in claim 43, wherein the circuit switched channel (see Fig. 11, col. 19, lines 58-66) is capable of operation via a packet switched core network and a circuit switched core network of the communication system (see Fig. 9, item "161 "means for packet switched communication col. 19, lines 58-66, and col. 21, lines 19-44).

Regarding to claim 63. Dent teaches a communication system as claimed in claim 63, wherein equal numbers of time slots in each frame are allocated to the data channel (see col. 2,*lines 8-27)* for circuit switched communications and the data channel for packet switched communications (see col. 1, lines 53-61).

Regarding to claim 64. Dent teaches a communication system as claimed in claim 63, wherein half the number of slots are allocated to the data channel (see col. 2, lines 8-27) for packet switched communications are allocated to the data channel for circuit switched communications (see col. 1, lines 53-61, col. 18, lines 44-60).

Regarding to claim 65. Dent teaches a communication system as claimed in claim 63, wherein a quarter of the number of slots are allocated to the data channel (see col. 2, lines 8-27) for packet switched communications are allocated to the data channel for circuit switched communications (see col. 6, lines 38-65, "when factor is 4, frame-length/slot is 32 means quarter rate 1/4" and col. 15, line 53-to-col. 16, line 7).

Regarding to claim 66. Dent teaches a communication system as claimed in claim 63, wherein the data channel for circuit switched communications is a half rate data channel (see col. 1, lines 53-61, col. 18, lines 44-60).

Regarding to claim 67. Dent teaches a communication system as claimed in claim 63, wherein the data channel for circuit switched communications is a quarter rate data channel (see col. 6, lines 38-65, "when factor is 4, frame-length/slot is 32 means quarter rate 'h" and col. 15, line 53-to-col. 16, line 7).

Regarding to claim 70. Dent teaches a communication system as claimed in claim 63, wherein the data channel for packet switched communications is a half rate data channel (see col. 1, lines 53-61, col. 18, lines 44-60).

Regarding to claim 69. Dent teaches a communication system as claimed in claim 63, wherein control data for control of the data channel for packet switched

communications is carried by the data channel for circuit switched communications (see col. 5, line 10-49).

Regarding to claim 70. Dent teaches a communication system as claimed in claim 63, wherein the control data is for control of transmission power and/or handover of the channel (see col. 17, lines 3-16).

Regarding to claim 71. Dent teaches a communication system as claimed in claim 70, wherein the control data comprises a fast access control channel and/or a slow access control channel (see col. 5, line 10-49).

Regarding to claim 72. Dent teaches a communication system as claimed in claim 63, wherein the data channel for circuit switched communications is a conversational channel (see col. 5, lines 10-49, col. 14, lines 18-29, and col. 18, line 18-34).

Regarding to claim 73. Dent teaches a communication system as claimed in claim 63, wherein the data channel for circuit switched communications is a background channel (see col. 8, line 40-to-col. 9, line 16, and col. 12, lines 26-54).

Regarding to claim 74. Dent teaches a communication system as claimed in claim 63, wherein the data channel for packet switched communications is allocated time slots during periods when the data channel for circuit switched communications is relatively inactive (see col. 22, line 65-to-col. 23, line 24).

Regarding to claim 75. Dent teaches a communication system as claimed in claim 75, wherein the data channel for packet switched communications is allocated time slots (see col. 2, lines 8-27) during lulls in speech data being carried by means of

the data channel for circuit switched communications (see col. 22, line 65-to-col. 23, line 24).

Regarding to claim 76. Dent teaches a communication system as claimed in claim 63, wherein the circuit switched channel is via a circuit switched core network of the communication system (see Fig. 11, col. 19, lines 58-66, PSTN means circuit switched communications).

Regarding to claim 78. Dent teaches a communication system as claimed in claim 78, wherein each full or half rate data channel for packet switched communications is a streaming, interactive or background channel (see col. 8, line 40-to-col. 9, line 16, and col. 12, lines 26-54).

Regarding to claim 79. Dent teaches a communication system as claimed in claim 78, wherein each full, half or quarter rate data channel for circuit switched communications is a conversational channel (see col. 5, lines 10-49, col. 14, lines 18-29, and col. 18, line 18-34).

Regarding to claim 80. Dent teaches a communication system as claimed in claim 78, wherein said system has a mode of operation in which said wireless channel comprises first and second sub-channels; said first sub-channel comprising a half rate data channel for circuit switched communication (see col. 9, line 17-to-col. 10, line 26; and said second sub-channel comprising a half rate data channel for packet switched communication (see col. 9, line 17-to-col. 10, line 26).

Regarding to claim 81. Dent teaches a communication system as claimed in claim 78, wherein said system has a mode of operation in which said wireless channel

comprises first, second, third and fourth sub-channels each comprising a quarter rate data channel for circuit switched communication (see col. 6, lines 38-65, "when factor is 4, frame-length/slot is 32 means quarter rate '/4" and col. 15, line 53-to-col. 16, line 7).

Regarding to claim 82. Dent teaches a communication system as claimed in claim 78, wherein said system has a mode of operation in which said wireless channel comprises first, second and third sub-channels (see col. 9, line 17-to-col. 10, line 26); said first sub-channel comprising a quarter rate data channel for circuit switched communication (see col. 9, line 17-to-col. 10, line 26); said second sub-channel comprising a quarter rate data channel for circuit switched communication (see col. 9, line 17-to-col. 10, line 26, and col. 6, lines 38-65, and col. 15, line 53-to-col. 16, line 7); and said third sub-channel comprising a half rate data channel for packet switched communication (see col. 1, lines 53-61, col. 18, lines 44-60).

Regarding to claim 83 Dent teaches a communication system according to claim 78, wherein said system has a mode of operation in which said wireless channel comprises first, second and third sub-channels; said first sub-channel comprising a quarter rate data channel for circuit switched communication (see col. 9, line 17-to-col. 10, line 26); said second sub-channel comprising a quarter rate data channel for circuit switched communication (see col. 9, line 17-to-col. 10, line 26, and col. 6, lines 38-65, and col. 15, line 53-to-col. 16, line 7); and said third sub-channel comprising a half rate data channel for packet switched communication (see col. 1, lines 53-61, col. 18, lines 44-60).

4. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dent and Tran as applied to claim 43 above and further in view of Chang et al. (US PAT PUB 2001/0040883), hereinafter referred to as Chang.

In regards to claim 44, Dent and Tran teach a variable rate system as described in the rejections of claim 43 above.

Dent and Tran do not explicitly teach, time slots in each frame are allocated to the data channel for circuit switched communications and the data channel for packet switched communications.

Chang in the same field of endeavor teaches time slots in each frame being allocated to the data channel for circuit switched communications and the data channel for packet switched communications (section 0155-0156).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dent and Tran's system/method by incorporating the concept of time slots in each frame being allocated to the data channel for circuit switched communications and the data channel for packet switched communications as taught by Chang. The motivation is that the ability to send both circuit switched data and packet switched data within same frame makes the system robust and enables efficient use of bandwidth.

Dent, Tran and Chang do not teach allocating equal number of time slots being allocated for circuit switched and data switched communication.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dent, Tran and Cheng's system/method by incorporating

the concept of allocating equal number of time slots being allocated for circuit switched and data switched communication as any arbitrary number of time slots can be allocated for both packet and circuit switched communication based on network need, available resources and contracted quality of service; to make efficient use of the available bandwidth.

5. Claims 43-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dent in view of Chang et al. (US PAT PUB 2001/0040883), hereinafter referred to as Chang.

In regards to claim 43 Dent teaches a telecommunications system comprising a first station adapted to communicate with a second station over a wireless channel (see col. 1, lines 9-16), data being carried over the wireless channel in superframes (see Fig. 2), each superframe comprising a plurality of frames (see col. 5, lines 9-49) and each frame comprising a plurality of timeslots (see col. 12, lines 14-25); the system having: a first mode of operation in which a full rate data channel for circuit switched communications (see Fig. 11, col. 19, lines 58-66, PSTN means circuit switched communications) is defined by an allocation to that data channel (see col. 2, lines 8-27) of corresponding time slots in each frame (see col. 18, lines 44-60); a second mode of operation in which two half rate data channels for circuit switched, communications are defined by an allocation to each of said two data channels (see col. 2, lines 8-27) of an equal number of corresponding time slots of frames in each superframe (see col. 1, lines 53-61, col. 18, lines 44-60); a third mode of operation in which four quarter rate data channels for circuit switched communications are defined

by the allocation to each of those data channels (see col. 2, lines 8-27) of an equal number of corresponding time slots of frames in each superframe (see col. 6, lines 38-65, "when factor is 4, frame-length/slot is 32 means quarter rate 1/4" and col. 15, line 53-to-col. 16, line 7).

Dent does not explicitly teach a first mode of operation and a second mode of operation (cited in the claim as fourth mode and fifth mode respectively) is being done in a packet switched communication.

Chang in the same field of endeavor teaches interleaving of Both Half Rate and Full Rate Channels Suitable for Half Duplex Operation to GERAN (GSM EDGE (Enhanced General Packet Radio Service) Radio Access Network) (section 0051, GERAN is packet based).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dent's system/method by incorporating the concept of using packet switched data at both Half Rate and Full Rate Channels as taught by Chang. The motivation is that packet data provides more network robustness due to path independence and the routers' ability to select alternative paths in the event of network node failure. Packet switching, therefore, allows for more efficient use of the network lines.

Regarding to claim 77. Dent teaches a communications system comprising a first station adapted to communicate with a second station over a wireless channel (see col. 1, lines 9-16), data being carried over the wireless channel in superframes, each superframe comprising a plurality of frames (see col. 5, lines 9-49) and each frame

comprising a plurality of timeslots (see col. 12, lines 14-25); the system having: a first mode of operation in which a full rate data channel for switched communications is defined by the allocation to that data channel (see col. 2, lines 8-27) of corresponding time slots in each frame (see col. 18, lines 44-60); a second mode of operation in which two half rate data channels for switched communications are defined by the allocation to each of those data channels (see col. 2, lines 8-27) of an equal number of corresponding time slots of frames in each superframe (see col. 1, lines 53-61, col. 18, lines 44-60).

Dent does not explicitly teach a first mode of operation and a second mode of operation is being done in a packet switched communication.

Chang in the same field of endeavor teaches interleaving of Both Half Rate and Full Rate Channels Suitable for Half Duplex Operation to GERAN (GSM EDGE (Enhanced General Packet Radio Service) Radio Access Network) (section 0051, GERAN is packet based).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dent's system/method by incorporating the concept of using packet switched data at both Half Rate and Full Rate Channels as taught by Chang. The motivation is that packet data provides more network robustness due to path independence and the routers' ability to select alternative paths in the event of network node failure. Packet switching, therefore, allows for more efficient use of the network lines.

Regarding to claim 62 Dent teaches a communication system comprising a first station adapted to communicate with a second station over a wireless channel (see col. 1, lines 9-16), data being carried over the wireless channel in superframes (see Fig. 2), each superframe comprising a plurality of frames (see col. 5, lines 9-49) and each frame comprising a plurality of timeslots (see col. 12, lines 14-25); the system having a mode of operation in which a data channel for circuit switched communications (see Fig. 11, col. 19, lines 58-66, PSTN means circuit switched communications) is defined by the allocation to that channel of corresponding time slots (see col. 2, lines 8-27) of some of the frames of each superframe,

Dent does not explicitly teach using channel time slots as data channel for packet switched communications.

Chang in the same field of endeavor teaches interleaving of Both Half Rate and Full Rate Channels Suitable for Half Duplex Operation to GERAN (GSM EDGE (Enhanced General Packet Radio Service) Radio Access Network) (section 0051, GERAN is packet based).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dent's system/method by incorporating the concept of using packet switched data at both Half Rate and Full Rate Channels as taught by Chang. The motivation is that packet data provides more network robustness due to path independence and the routers' ability to select alternative paths in the event of network node failure. Packet switching, therefore, allows for more efficient use of the network lines.

Regarding to claim 44. Dent teaches a communication system as claimed in claim 43, wherein equal numbers of timeslots in each frame are allocated to the data channel (see col. 2,lines 8-27) for circuit switched communications and the data channel for packet switched communications (see col. 1, lines 53-61).

Regarding to claim 45. Dent teaches a communication system as claimed in claim 43, wherein half the number of slots are allocated to the data channel for packet: switched communications are allocated to the data channel for circuit switched communications (see col. 1, lines 53-61, col. 18, lines 44-60).

Regarding to claim 46. Dent teaches a communication system as claimed in claim 43, wherein a quarter of the number of slots are allocated to the data channel (see col. 2, lines 8-27) for packet switched communications are allocated to the data channel for circuit switched communications (see col. 6, lines 38-65, "when factor is 4, frame-length/slot is 32 means quarter rate 4" and col. 15, line 53-to-col. 16, line 7).

Regarding to claim 47. Dent teaches a communication system as claimed in claim 43, wherein the data channel for circuit switched communications is a half rate data channel (see col. 1, lines 53-61, col. 18, lines 44-60).

Regarding to claim 48. Dent teaches a communication system as claimed in claim 43, wherein the data channel for circuit switched communications is a quarter rate data channel (see col. 6, lines 38-65, "when factor is 4, frame-length/slot is 32 means quarter rate '/. " and col. 15, line 53-to-col. 16, line 7).

Regarding to claim 49. Dent teaches a communication system as claimed in claim 43, wherein the data charnel for packet switched communications (see Fig. 9,

item "161 "means for packet switched communication) is a half rate data channel (see col. 1, lines 53-61, col. 18, lines 44-60).

Regarding to claim 50. Dent teaches a communication system as claimed in claim 43, wherein control data for control of the data channel for packet switched communications is carried by the data channel for circuit switched communications (see col.9, lines 1-16, and col. 19, lines 58-66).

Regarding to claim 51. Dent teaches a communication system as claimed in claim 51, wherein the control data is for control of transmission power and/or handover of the channel, link adaptation (see col. 17, lines 3-16).

Regarding to claim 52. Dent teaches a communication system as claimed in claim 51, wherein the control data comprises a fast associated control channel and/or a slow associated control channel (see col. 5, lines 10-49).

Regarding to claim 53. Dent teaches a communication system as claimed in claim 43, wherein the data channel for circuit switched communications is a conversational channel (see col. 5, lines 10-49, col. 14, lines 18-29, and col. 18, line 18-34).

Regarding to claim 54. Dent teaches a communication system as claimed in claim 43, wherein the data channel for circuit switched communications is a background channel (see col. 8, line 40-to-col. 9, line 16, and col. 12, lines 26-54).

Regarding to claim 55. Dent teaches a communication system as claimed in claim 43, wherein the data channel for packet switched communications is allocated

time slots during periods (see col. 2, lines 8-27) when the data channel for circuit switched communications is relatively inactive (see col. 22, line 65-to-col. 23, line 24).

Regarding to claim 56. Dent teaches a communication system as claimed in claim 56, wherein the data channel for packet switched communications is allocated time slots (see col. 2, lines 8-27) during lulls in speech data being carried by means of the data channel for circuit switched communications (see col. 22, line 65-to-col. 23, line 24).

Regarding to claim 57. Dent teaches a communication system as claimed in claim 43, wherein the wireless channel (see col. 2, lines 8-27) comprises a circuit switched air-interface data being carried over said circuit switched air-interface (see Fig. 11, col. 2, lines 8-27) via circuit switched data and packet data (see Fig. 9, item "161 "means for packet data).

Regarding to claim 58. Dent teaches a communication system as claimed in claim 58, wherein said circuit switched air interface (see Fig. 11, col. 2, lines 8-27) is connectable to a packet switched core network (see Fig 9, item "161 "means for packet switched communication).

Regarding to claim 59. Dent teaches a communication system as claimed in claim 43, wherein the circuit switched channel is via a circuit switched core network of the communication system (see Fig. 11, col. 19, lines 58-66, PSTN means circuit switched communications).

Regarding to claim 60. Dent teaches a communication system as claimed in claim 43, wherein the packet switched channel is capable of operation via a packet

switched core network of the communication system (see Fig. 9, item "161 "means for packet switched communication, col. 19, lines 58-66, and col. 21, lines 19-44).

Regarding to claim 61. Dent teaches a communication system as claimed in claim 43, wherein the circuit switched channel (see Fig. 11, col. 19, lines 58-66) is capable of operation via a packet switched core network and a circuit switched core network of the communication system (see Fig. 9, item "161 "means for packet switched communication col. 19, lines 58-66, and col. 21, lines 19-44).

Regarding to claim 63. Dent teaches a communication system as claimed in claim 63, wherein equal numbers of time slots in each frame are allocated to the data channel (see col. 2,*lines 8-27)* for circuit switched communications and the data channel for packet switched communications *(see col. 1, lines 53-61).*

Regarding to claim 64. Dent teaches a communication system as claimed in claim 63, wherein half the number of slots are allocated to the data channel (see col. 2, lines 8-27) for packet switched communications are allocated to the data channel for circuit switched communications (see col. 1, lines 53-61, col. 18, lines 44-60).

Regarding to claim 65. Dent teaches a communication system as claimed in claim 63, wherein a quarter of the number of slots are allocated to the data channel (see col. 2, lines 8-27) for packet switched communications are allocated to the data channel for circuit switched communications (see col. 6, lines 38-65, "when factor is 4, frame-length/slot is 32 means quarter rate 1/4" and col. 15, line 53-to-col. 16, line 7).

Regarding to claim 66. Dent teaches a communication system as claimed in claim 63, wherein the data channel for circuit switched communications is a half rate data channel (see col. 1, lines 53-61, col. 18, lines 44-60).

Regarding to claim 67. Dent teaches a communication system as claimed in claim 63, wherein the data channel for circuit switched communications is a quarter rate data channel (see col. 6, lines 38-65, "when factor is 4, frame-length/slot is 32 means quarter rate 'h" and col. 15, line 53-to-col. 16, line 7).

Regarding to claim 68. Dent teaches a communication system as claimed in claim 63, wherein the data channel for packet switched communications is a half rate data channel (see col. 1, lines 53-61, col. 18, lines 44-60).

Regarding to claim 69. Dent teaches a communication system as claimed in claim 63, wherein control data for control of the data channel for packet switched communications is carried by the data channel for circuit switched communications (see col. 5, line 10-49).

Regarding to claim 70. Dent teaches a communication system as claimed in claim 63, wherein the control data is for control of transmission power and/or handover of the channel (see col. 17, lines 3-16).

Regarding to claim 71. Dent teaches a communication system as claimed in claim 70, wherein the control data comprises a fast access control channel and/or a slow access control channel (see col. 5, line 10-49).

Regarding to claim 72. Dent teaches a communication system as claimed in claim 63, wherein the data channel for circuit switched communications is a

conversational channel (see col. 5, lines 10-49, col. 14, lines 18-29, and col. 18, line 18-34).

Regarding to claim 73. Dent teaches a communication system as claimed in claim 63, wherein the data channel for circuit switched communications is a background channel (see col. 8, line 40-to-col. 9, line 16, and col. 12, lines 26-54).

Regarding to claim 74. Dent teaches a communication system as claimed in claim 63, wherein the data channel for packet switched communications is allocated time slots during periods when the data channel for circuit switched communications is relatively inactive (see col. 22, line 65-to-col. 23, line 24).

Regarding to claim 75. Dent teaches a communication system as claimed in claim 75, wherein the data channel for packet switched communications is allocated time slots (see col. 2, lines 8-27) during lulls in speech data being carried by means of the data channel for circuit switched communications (see col. 22, line 65-to-col. 23, line 24).

Regarding to claim 76. Dent teaches a communication system as claimed in claim 63, wherein the circuit switched channel is via a circuit switched core network of the communication system (see Fig. 11, col. 19, lines 58-66, PSTN means circuit switched communications).

Regarding to claim 78. Dent teaches a communication system as claimed in claim 78, wherein each full or half rate data channel for packet switched communications is a streaming, interactive or background channel (see col. 8, line 40-to-col. 9, line 16, and col. 12, lines 26-54).

Regarding to claim 79. Dent teaches a communication system as claimed in claim 78, wherein each full, half or quarter rate data channel for circuit switched communications is a conversational channel (see col. 5, lines 10-49, col. 14, lines 18-29, and col. 18, line 18-34).

Regarding to claim 80. Dent teaches a communication system as claimed in claim 78, wherein said system has a mode of operation in which said wireless channel comprises first and second sub-channels; said first sub-channel comprising a half rate data channel for circuit switched communication (see col. 9, line 17-to-col. 10, line 26; and said second sub-channel comprising a half rate data channel for packet switched communication (see col. 9, line 17-to-col. 10, line 26).

Regarding to claim 81. Dent teaches a communication system as claimed in claim 78, wherein said system has a mode of operation in which said wireless channel comprises first, second, third and fourth sub-channels each comprising a quarter rate data channel for circuit switched communication (see col. 6, lines 38-65, "when factor is 4, frame-length/slot is 32 means quarter rate '/4" and col. 15, line 53-to-col. 16, line 7).

Regarding to claim 82. Dent teaches a communication system as claimed in claim 78, wherein said system has a mode of operation in which said wireless channel comprises first, second and third sub-channels (see col. 9, line 17-to-col. 10, line 26); said first sub-channel comprising a quarter rate data channel for circuit switched communication (see col. 9, line 17-to-col. 10, line 26); said second sub-channel comprising a quarter rate data channel for circuit switched communication (see col. 9, line 17-to-col. 10, line 26, and col. 6, lines 38-65, and col. 15, line 53-to-col. 16, line 7);

and said third sub-channel comprising a half rate data channel for packet switched communication (see col. 1, lines 53-61, col. 18, lines 44-60).

Regarding to claim 83. Dent teaches a communication system according to claim 78, wherein said system has a mode of operation in which said wireless channel comprises first, second and third sub-channels; said first sub-channel comprising a quarter rate data channel for circuit switched communication (see col. 9, line 17-to-col. 10, line 26); said second sub-channel comprising a quarter rate data channel for circuit switched communication (see col. 9, line 17-to-col. 10, line 26, and col. 6, lines 38-65, and col. 15, line 53-to-col. 16, line 7); and said third sub-channel comprising a half rate data channel for packet switched communication (see col. 1, lines 53-61, col. 18, lines 44-60).

In regards to claim 44, Dent does not explicitly teach, time slots in each frame are allocated to the data channel for circuit switched communications and the data channel for packet switched communications.

Chang in the same field of endeavor teaches time slots in each frame being allocated to the data channel for circuit switched communications and the data channel for packet switched communications (section 0155-0156).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dent's system/method by incorporating the concept of time slots in each frame being allocated to the data channel for circuit switched communications and the data channel for packet switched communications as taught by Chang. The motivation is that the ability to send both circuit switched data and packet

switched data within same frame makes the system robust and enables efficient use of bandwidth.

Dent and Chang do not teach allocating equal number of time slots being allocated for circuit switched and data switched communication.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dent and Cheng's system/method by incorporating the concept of allocating equal number of time slots being allocated for circuit switched and data switched communication as any arbitrary number of time slots can be allocated for both packet and circuit switched communication based on network need, available resources and contracted quality of service; to make efficient use of the available bandwidth.

***Response to Arguments***

6. Applicant's arguments, pages 1-3 of the Response to Office Action section, filed 5/7/2007, with respect to the rejections of the claims have been fully considered but are not persuasive.

Applicant argues (see page 1 second paragraph, page 2 first paragraph) that *one of ordinary skill in the art would not disregard the differences between circuit switched and packet switched connections and implement a communication system having modes of operation in which a combination of full rate and part rate channels are allocated to circuit switched and packet switched communications as recited in claims 43 and 75*. However, Examiner respectfully disagrees with the assertion. It has been

held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Dent teaches the claimed invention in a circuit switched environment. Dent does not explicitly teach a first mode of operation and a second mode of operation (cited in the claim as fourth mode and fifth mode respectively) is being done in a packet switched communication. Tran in the same field of endeavor teaches (column 1 lines 35-45) subscriber units may attempt to increase efficiency for a wireless system that is primarily intended for circuit-switched traffic by using excess system capacity for packet-switched data services via similar subscriber unit equipment. As such Examiner respectfully disagrees with the assertion that Dent in view of Tran "*disregard the differences between circuit switched and packet switched connections*" and "*implement a communication system having modes of operation in which a combination of full rate and part rate channels are allocated to circuit switched and packet switched communications*" as Tran clearly discloses "increase efficiency for a wireless system that is primarily intended for circuit-switched traffic by using excess system capacity for packet-switched data services via similar subscriber unit equipment". It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dent's circuit-switched TDMA system/method by incorporating the concept of using packet switched data services as taught by Tran.

Applicant argues (see page 2 second paragraph) that *such combination of channels allows the potential efficiency gains from using half-rate channels to be fully realized. Neither one of the two applied patents recognizes or addresses the problem that the potential efficiency gains are not fully realized because of a mismatch in the number of circuit switched connections requesting a half rate channel at one time.* However, Examiner respectfully disagrees with such assertion. As mentioned in the earlier office action Response to Argument section, the claimed limitations do not reflect what the Applicant has argued above. The claims do not cite limitations related to the expected efficiency gains being not fully realized because of a mismatch in the number of circuit switched connections requesting a half rate channel at any one time. Applicant further *argues claims 43 and 75 do indeed contain relevant limitations relating to realizing the efficiency gains. Specifically, the claims recite the solution presented by the claimed invention to solve the problem. The claims do not recite limitations related to the problem recognized and addressed by the inventors, as the problem does not need to be included in the claims for them to be distinguished over the prior art.* Examiner submits that, *"realizing the efficiency gains"* is a disclosed invention, not a claimed invention. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., *"realizing the efficiency gains*) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant argues (see page 2 third paragraph) that *the obviousness rejection fails to set forth a convincing rationale for making the proposed combination of references so as to arrive at the claimed invention. While applicants have identified a problem that they recognized and addressed by the solution of the claimed invention, the applied patents provide no such reason. The rejection points out that the Tran patent teaches some of the general advantages of packet switched communications. But such teaching merely suggests using packet switched communications instead of circuit switched communications.* However, Examiner respectfully disagrees with the assertion. Dent teaches the cited limitations of the claims in the circuit switched environment, while, Tran suggests to incorporate packet switch services to it to increase efficiency. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Applicant argues (see page 2 fourth paragraph) that *each of the independent claims distinguishes over the applied patents by requiring a half-rate data channel for packet-switched communications.* Examiner respectfully submits that the cited references do teach the above limitations. Specifically, Dent teaches half rate data channel being used (column 6 lines 45-54, "when factor is 2, frame-length/slot is 16 means quarter rate 1/2"). In this case, Dent teaches the claimed invention in a circuit switched environment. Dent does not explicitly teach a first mode of operation and a

second mode of operation (cited in the claim as fourth mode and fifth mode respectively) is being done in a packet switched communication. Tran in the same field of endeavor teaches (column 1 lines 35-45) subscriber units may attempt to increase efficiency for a wireless system that is primarily intended for circuit-switched traffic by using excess system capacity for packet-switched data services via similar subscriber unit equipment. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dent's circuit-switched TDMA system/method by incorporating the concept of using packet switched data services as taught by Tran. As such it can be seen that, Dent in view of Tran do teach the cited limitation "*a half-rate data channel for packet-switched communications*". Applicant further argues that *the Office Action asserts that "the present claim language is broad and in view of the broadest reasonable interpretation of the claim language the cited reference to teach the claimed communications". (see paragraph bridging pages 17 and 18). However, there is no interpretation provided in the rejection. Nor does the rejection identify where either patent discloses a half-rate data channel for packet-switched communications.* Examiner respectfully submits that the present claim language is indeed broad and in view of the broadest reasonable interpretation of the claim language the cited reference do teach the cited limitations. Further in response to the Applicant's argument regarding "*there is no interpretation provided in the rejection. Nor does the rejection identify where either patent discloses a half-rate data channel for packet-switched communications*" the Examiner respectfully submits that Dent does indeed teach half rate data channel being used (column 6 lines 45-54, "when factor is 2, frame-length/slot is 16 means

quarter rate 1/2"). However, in this case, Dent teaches the claimed invention in a circuit switched environment. Dent does not explicitly teach a packet switched communication. Tran in the same field of endeavor teaches (column 1 lines 35-45) subscriber units may attempt to increase efficiency for a wireless system that is primarily intended for circuit-switched traffic by using excess system capacity for packet-switched data services via similar subscriber unit equipment. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dent's circuit-switched TDMA system/method for efficiency purpose, by incorporating the concept of using packet switched data services as taught by Tran. As such, Examiner respectfully submits that the cited references in combination do indeed teach the limitation "*a half-rate data channel for packet-switched communications*".

Applicant argues (see page 3 second paragraph) that *neither one of the applied patents discloses half-rate channels for packet-switched communication, which is a feature included in each of the independent claims*. However, as mentioned earlier, Dent does indeed teach half rate data channel being used (column 6 lines 45-54, "when factor is 2, frame-length/slot is 16 means quarter rate 1/2"). Tran teaches adding packet switched service to circuit switched network to increase efficiency. As such Dent in view of Tran do indeed teach half-rate channels for packet-switched communication. Applicant argues, *under any reasonable interpretation of this claim language, it is not correct for the term "a half-rate channel for packet switched communications" to be construed so broadly so as to cover half-rate channels that are not for packet-switched communications.* However, Examiner submits that the test for obviousness is not

whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In regards to instant Application, the combined teaching of Dent and Tran would have suggested the claimed limitations to those of ordinary skill in the art. Applicant further argues, "Si*nce neither one of the applied patents discloses half-rate channels for packet-switched communications, it is simply not true to say that the claim language can be construed so broadly that all of the claimed limitations are taught by the applied patents"* However, Examiner respectfully disagrees with the assertion. It has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). Examiner respectfully submits that Dent and Tran reference are in the same field of endeavor.

***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Salman Ahmed whose telephone number is (571) 272-8307. The examiner can normally be reached on 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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